CLAIMS

1. An optoelectronic device for acquiring machine-readable symbols, comprising:

a sensor array comprising a plurality of light sensing elements, the light sensing elements producing a signal representative a quantity of light incident on the respective light sensing element; and

a scanning control circuit coupled to selectively sample the respective signals from the light sensing elements of the sensor array and operable to change a resolution of the sensor array between at least a first resolution during at least a first sampling pass and a second resolution during at least a second sampling pass, the second sampling pass following the first sampling pass.

2. The optoelectronic device of claim 1 wherein the scanning control circuit is operable to determine an optimized resolution based on a measured value of a contrast of at least one category of symbol elements from an image.

3. The optoelectronic device of claim 1 wherein the sensor array is a two-dimensional array of light sensing elements arranged in a plurality of rows, the light sensing elements in each of the rows extending in a scanning direction, and the plurality of rows arranged in a direction perpendicular to the scanning direction with respect to one another.

4. The optoelectronic device of claim 1 wherein the sensor array is a two-dimensional array of light sensing elements arranged in a plurality of rows, the light sensing elements in each of the rows extending in a scanning direction, and the plurality of rows arranged in a direction perpendicular to the scanning direction with respect to one another, the light sensing elements in a first one of the rows having a first height measured in the direction perpendicular to the scanning direction, and the light sensing elements in a second one of the rows having a second height measured in

the direction perpendicular to the scanning direction, the second height different from the first height.

5. The optoelectronic device of claim 4 wherein the scanning control circuit selectively samples the signals from the light sensing elements in the first row during the first pass and selectively samples the signals from the light sensing elements in the second row during the second pass.

6. The optoelectronic device of claim 1 wherein the scanning control circuit during the first pass selectively samples signals from the light sensing elements in a first pair of rows having a first cumulative height in a direction perpendicular to a scanning direction, and during the second pass selectively samples signals from the light sensing elements in a second pair of rows having a second cumulative height in the direction perpendicular to the scanning direction, different than the first cumulative height.

7. The optoelectronic device of claim 1 wherein the scanning control circuit during the first pass selectively samples signals from the light sensing elements in a first number of rows having a cumulative first height in a direction perpendicular to a scanning direction, and during the second pass selectively samples signals from the light sensing elements in a second number of rows having a cumulative second height in the direction perpendicular to the scanning direction, the cumulative second height different than the cumulative first height.

8. The optoelectronic device of claim 1 wherein the sensor array is a two-dimensional array of light sensing elements arranged in a plurality of rows, the light sensing elements in each of the rows extending in a scanning direction, and the plurality of rows arranged in a direction perpendicular to the scanning direction with respect to one another, the light sensing elements in adjacent rows being offset from one another in the scanning direction.

9. The optoelectronic device of claim 8 wherein the light sensing elements are sampled in order generally along the scanning direction and alternating between immediately adjacent ones of the rows.

10. A method of operating an optoelectronic device to acquire machine-readable symbols, the optoelectronic device including a sensor array comprising a plurality of light sensing elements, each of light sensing elements producing a signal representative of a quantity of light incident on the respective light sensing element, the method comprising:

receiving signals from a first set of the light sensing elements at a first resolution during a first sampling pass across the sensor array while an image of a first machine-readable symbol is formed on the sensor array; and

receiving signals from a second set of light sensing elements at a second resolution during a second sampling pass across the sensor array while the image of the first machine-readable symbol is formed on the sensor array, the second resolution different from the first resolution.

11. The method of claim 10, further comprising:

determining an optimized resolution based on a measured value of a contrast of at least one category of symbol elements from an image.

12. The method of claim 10 wherein the sensor array is a two-dimensional array of light sensing elements arranged in a plurality of rows, the light sensing elements in each of the rows extending in a scanning direction, and the plurality of rows arranged in a direction perpendicular to the scanning direction with respect to one another, the light sensing elements in a first one of the rows having a first height measured in the direction perpendicular to the scanning direction, and the light sensing element in a second one of the rows having a second height measured in the direction perpendicular to the scanning direction, the second height different from the first height, and wherein receiving signals from a first set of the light sensing

elements at a first resolution during a first sampling pass comprises selectively sampling the signals from the light sensing elements in the first row during the first pass and wherein receiving signals from a second set of light sensing elements at a second resolution during a second sampling pass comprises selectively sampling the signals from the light sensing elements in the second row during the second pass.

13. The method of claim 10 wherein receiving signals from a first set of the light sensing elements at a first resolution during a first sampling pass comprises selectively sampling signals from the light sensing elements in a first pair of rows having a first cumulative height in a direction perpendicular to a scanning direction, and wherein receiving signals from a second set of light sensing elements at a second resolution during a second sampling pass comprises selectively sampling signals from the light sensing elements in a second pair of rows having a second cumulative height in the direction perpendicular to the scanning direction, the second cumulative height different than the first cumulative height.

14. The method of claim 10 wherein receiving signals from a first set of the light sensing elements at a first resolution during a first sampling pass comprises selectively sampling signals from the light sensing elements in a first number of rows having a first cumulative height in a direction perpendicular to a scanning direction, and wherein receiving signals from a second set of light sensing elements at a second resolution during a second sampling pass comprises selectively sampling signals from the light sensing elements in a second number of rows having a second cumulative height in the direction perpendicular to the scanning direction, the second cumulative height different than the first cumulative height.

15. The method of claim 10 wherein the sensor array is a two-dimensional array of light sensing elements arranged in a plurality of rows, the light sensing elements in each of the rows extending in a scanning direction, and the plurality of rows arranged in a direction perpendicular to the scanning direction with

respect to one another, the light sensing elements in adjacent rows being offset from one another in the scanning direction, and wherein the light sensing elements are sampled in order generally along a scanning direction, alternating between immediately adjacent rows of the sensor array.

16. The method of claim 10, further comprising:

determining a resolution for the sensor array after each sampling pass based on at least one of: i) at least one previously measured value of at least one parameter representing a quality of a previously acquired image and ii) at least one item of information resulting from a decoding of an image of a symbol acquired in a previous sampling pass.

17. The method of claim 10, further comprising:

determining a new height for a set of the light sensing elements after each sampling pass based on at least one previously measured value of at least one parameter representing a quality of an image of a symbol acquired by the optoelectronic device, the quality selected from: a maximum spatial frequency of the image in a scanning direction, a maximum intensity of at least one category of symbol element in the image, a minimum intensity of at least one category of symbol element in the image, and a contrast of at least one category of symbol element in the image.

18. The method of claim 10, further comprising:

determining a new height for a set of light sensing elements after each sampling pass based on a rotational sensitivity to maximize a field of depth for the sensor array.

19. The method of claim 10, further comprising:

determining, after each sampling pass, a measured value of a maximum spatial frequency of an image in a scanning direction, and an optimized value of a height for a set of light sensing elements in a direction perpendicular to the scanning

direction based on an affine function of an inverse of a measured value of a maximum frequency for an image of a symbol in the scanning direction.

20. The method of claim 10, further comprising:

determining an optimized value of a height for a set of light sensing elements in a direction perpendicular to a scanning direction based on at least one function having at least one parameter having a value determined at least in part by a type of symbol to be acquired.

21. The method of claim 10, further comprising:

determining, after at least one pass, a type for a symbol to be acquired and a parametric coefficient based on the determined type.

22. The method of claim 10, further comprising:

determining an optimized value of a height of a set of light sensing elements in a direction perpendicular to a scanning direction according to a function parameterized by a predefined value of a maximum permitted angular deviation of the sensor array around an optical axis relative to a symbol to be acquired.

23. The method of claim 10, further comprising:

determining an optimized value of a height of a set of light sensing elements in a direction perpendicular to a scanning direction based on a measured value of a contrast of at least one category of symbol elements from an image.